

Calibration of 3D Woven Preform Design Code for CMC Materials, Phase II

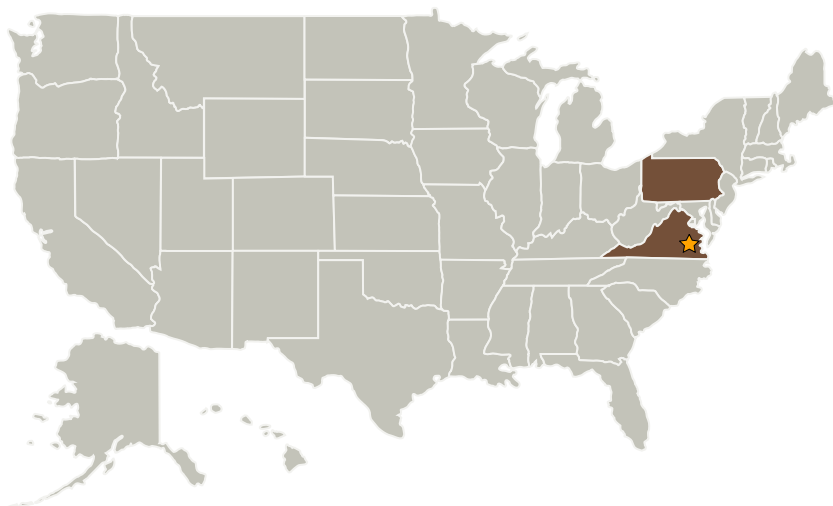
Completed Technology Project (2009 - 2011)



Project Introduction

Mechanical and thermal performance of CMC components benefit from low part count, integrally fabricated designs of 3D woven reinforcement. The advantages of these designs include the elimination for the need for post-fabrication mechanical attachment and the higher interlaminar properties offered by the through thickness paths of the fibers within the 3D preform architectures. The specific innovations MR&D is proposing are to improve the preform geometry definition through the use of the Kansas State University digital element approach, improve the material properties calculation module using a modified unit cell algorithm associated with the new geometry, and enhance the code calibration through additional CMC fabrication, imaging and material property testing.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Materials Research and Design, Inc.	Supporting Organization	Industry	Wayne, Pennsylvania



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations

Pennsylvania

Virginia

Project Transitions



December 2009: Project Start



December 2011: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.1 Materials
 - └ TX12.1.1 Lightweight Structural Materials